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RATES OF REFERRALS BY DUTCH GENERAL PRACTITIONERS TO MEDICAL SPECIALISTS -
SOME THEORETICAL NOTIONS AND EMPIRICAL RESULTS.

*Paper for the European General Practice Research Workshop at Rheinfelden,
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1. Introduction

My first intention for this presentation, to give an overview of the investigations undertaken at the Netherlands Institute of General Practitioners, turned out to be impossible to realize in the time I have got. Instead of that, I will split this presentation into two parts: first I will give some theoretical notions about the concept 'referral rate', and in the second part I will show some results of an investigation into the main determinants of referral rates of Dutch general practitioners. Nearly all referral-research in Holland is done with referral data that are easy to come by, but show major deficiencies. So first I will devote some attention to the question how referral rates in the Dutch system should be measured if we would not be bothered by problems of budget and manpower. Since in reality these problems always bother us, the research I will show some results of is of the 'classical' type, with sub-optimal data.

2. Some theoretical notions

In research trying to explain differences in referral rates by general practitioners, the first question we should ask is: what is a referral rate? The answer to this simple question turns out to be rather complex, at least in the Dutch system.

Before I shall try to answer the question I will, as far as necessary, briefly describe the Dutch health care system with respect to referrals. About 70 % of the population of the Netherlands is publicly insured under the Sick Fund Act. For most of these people insurance is compulsory and covers practically the full range of medical service. Participation is limited to people with an income below a certain sum a year.

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The remaining 30%, being the wealthier part of the population, can take a private insurance on a voluntary basis. In practice all private patients are insured for the cost of hospital admissions, in- and outpatient specialist care, obstetrical care, ambulance transport, protheses, fysiotherapy and specialist-prescribed drugs. 65% of them also insured the cost of general practitioners and drugs prescribed by them. A growing number of private patients chose for an insurance with a relatively low premium in combination with rather high deductibles.

For his sick-fund-patients the general practitioner is paid on a capitation basis; the remuneration for his private patients is of the fee for service type.

Every time a g.p. wants to refer a sick-fund-patient to a medical specialist, he has to fill in a 'referral card', which entitles the patient to one month of out-patient specialist care. For a referral card the specialist gets a certain sum of money from the sick-fund. If the specialist wants to continue the treatment of the patient after the first month he has to write a so called 'continuation-card' for every following month of out-patient care. After one year of out-patient specialist care, the g.p. has to fill in a new referral-card if treatment is to be continued. Unfortunately, this new referral-card can in no way be distinguished from the first, 'real' referral-card. Every year every sick-fund in Holland makes a tabulation of the number of referral cards per 1000 sick-fund-patients for every solo general-practitioner; for associations, group-practices and health-centres, in which more than one physician is involved, tabulation is done for all the g.p.'s in the group together.

For the whole country, the National Information System of the Sick-Funds (LISZ) presents tabulation of referral rates for the whole country from different points of view (e.g. per municipality, per size of the list, per type of practice, etcetera).

Data on referrals of private patients are practically absent.

In theory, a private insurance company only refunds the bills of medical specialists to the patient if the patient can produce a referral-note from his g.p.

In practice, however, many private insurance companies never ask these notes. This has two consequences: first, that there is no standard set of data on referral rates of private patients, and

second, that one of the essential features of the Dutch health care system, being the fact that one can only see a specialist after referral by a g.p., pertains less strictly to private patients. Due to the rather personal bond between patients and their g.p. in Holland, however, it is thought that only very few private patients will see a specialist without first consulting their family doctor on the matter. An unproblematic exception to this rule is the case of referrals for problems with the refraction of the eye: all private companies officially allow their clients to consult an eye-doctor directly. Similarly, a sick-fund-patient normally gets an ophthalmologic referral-card from the g.p.'s secretary without seeing the g.p. himself. After this brief description of referrals in the Dutch health care system, we can go back to our first question: 'what is a referral rate?' The answer of course might be (and often is): the total number of referral-cards per 1000 sick-fund-patients per g.p. per year. (I will leave private patients aside for some time). The advantage of this definition of a referral rate is obvious: the referral rates for all g.p.'s, group practices and health centres are available 'ready for use' (that is to say if we get the necessary consent for using) and research can start. This, to get ahead of most of the rest of this lecture, is the definition of referral rate which is used in the majority of investigations in Holland which try to explain differences in referral rates between general practitioners. There are, however, some problems. These problems will become clear when we look at the distinction that van Es and Pijlman, two pioneers of referral-research in Holland, made between various types of referrals. These authors distinguished five types of referrals:

slide 1

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|-----------|---|--------|
| 'passive' | 1. referrals to the eye-doctor for refraction problems of the eye; | - 20 % |
| | 2. referrals to continue specialist treatment for more than one year; | - 25 % |
| | 3. referrals 'after the event', being referral-cards written after acute hospital admission or acute visit to out-patients' department; | - 5 % |
| 'active' | 4. referrals on patient's request; | - 20 % |
| | 5. referrals on the initiative of the general practitioner. | - 30 % |

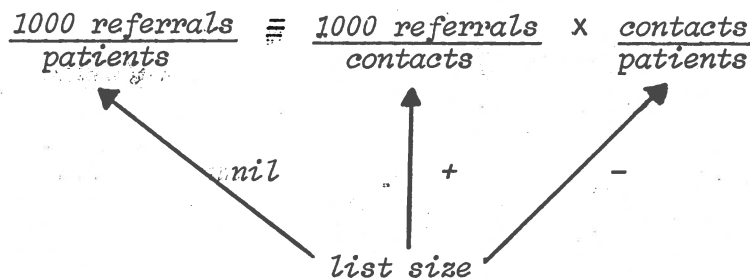
Two colleagues of mine, Posthuma and Van der Zee, made some interesting remarks on this classification. They stated that the only type of referral that can unambiguously be classified as an 'active' referral by the general practitioner (the case in which a g.p. decides that, as a result of his findings the patient needs specialist diagnosis or treatment) is the referral of type 5. But, of course, a doctor can only decide to refer a patient if he has a contact with that patient, that means that this type of referral should not be related to the number of patients the doctor has, but to the number of contacts he has with his patients, which can be quite something else. So we see that at least for one component of the total referral rate the number of referrals should be related to the number of contacts between the doctor and his patients, rather than to the number of patients as such. For type 4 referrals (at patient's request) the same line of reasoning holds. It's true that we cannot speak of a real 'decision' of the g.p. to refer the patient; in some cases the doctor might even feel very reluctant about referring, but in order to keep up good relations with the patient he is more or less forced to do so. On the other hand, it is the g.p. after all who is responsible for the decision to grant the request for referral or to refuse it. Anyhow, it is obvious that, like type 5, these referrals should be related to the number of contacts rather than to the number of patients. Type 1, to go back to the scheme, gives us no problems. No general practitioner in Holland prescribes spectacles, and normally a telephone-call to the surgery stating that one wants to see the eye-doctor is enough to collect the referral-card a few minutes later. Clearly, these referrals should be related to the number of patients. Furthermore, this type of referral can unambiguously be classified as 'passive' or 'administrative': the doctor takes no decision at all, but simply reacts in a way determined by convention to a patient's request. He may not even know for which patient he is actually signing the referral-card. This passive or administrative character can also be ascribed to type 2 referrals. In theory, the g.p. is free to refuse the specialist's request for a new referral-card after a year, but in practice this freedom is close to nil. It is clear that relating these referrals to the number of contacts is not right; maybe the best thing is to relate them to the number of patients or to the total number of other referrals, since a patient has to be referred at all before this type of 'prolongation-referral', as it is sometimes called, can be made.

Type 3 is a passive type of referral too: the g.p. may sometimes find that the patient might as well or better have come to see him instead of going straight to the hospital, but will hardly ever refuse to refer the patient afterwards. Referrals of this type should, of course, be related to the number of patients.

It turns out, now, that the concept of 'referral rate' is not as simple as it first seemed to be. Not only should some referral-rates be computed with the number of contacts as the denominator rather than the number of patients, but besides that the act of signing a referral-card is not at all indicative of one single form of behaviour: it ranges from a mere administrative act to a well considered decision, with behaviour with a more or less mixed character in between. Of course the distinction I made here between different types of referrals has some aspects which are typical for the Dutch situation, but no doubt similar problems will arise in other systems.

The heterogeneous character of the referral rate has by nature consequences for the kind of theory or model with which we want to explain differences in crude referral rates. Or, to put the problem in another way, we should realise that variables that we use in a theory to explain differences in crude referral rates may influence different components of the total referral rate in different ways. I will give one example, which is much discussed in Holland: the relation between list size and referral rate. Reducing the list size, it is said, will enable the general practitioner to devote more time to his patient, to do more investigation himself and to solve more problems himself, resulting in lower referral rates. A sound reasoning from a common sense point of view, but empirical research gave either insignificant statistical relations between list size and referral rate or were contradictory. (probably due to problems of aggregation-level, a complication I will leave aside here). A glance at our five types of referrals makes it clear that there is no reason to suppose that list size will affect referral-rates of types one to three. Though research on this topic is far from abundant, estimations of the total percentage of referrals that fall in these three categories run around 50%. So one glance at our scheme is enough to see that about half of all referrals will not be affected by list size.

What is left are referrals on patient's request and on the initiative of the doctor. The first of these, it may be argued, may be influenced by list size to a certain degree. In less busy and hurried practices the doctor can take more time to explain the patient that going to a specialist is not really necessary and that he himself can treat the problem just as well. For the referrals decided upon by the g.p. on his own initiative, an influence of list size can definitely be supposed: if the general practitioner has the choice between either referring the patient or doing additional examinations or order the patient to come back for check-up after some time, the doctor in the large busy practice will be more inclined to choose the first alternative. So at least a moderate relationship between list size and crude referral reate should be expected. A closer look, however, will show that this hypothesis, too, is not as realistic as it seems. Let us look at slide 2.



The upper part of this table states a simple but clarifying truism: it says that the number of referrals per 1000 patients (our crude referral rate) is identical to the number of referrals per 1000 contacts times the number of contacts per patient. It is clarifying in the sense that it makes clear that the effect of list size on crude referral rate can analytically be split up in two parts: an effect on the number of contacts per patient and an effect on the number of referrals per 1000 contacts. The first effect, as has been proved in all research at this topic, is always negative: in larger practices, at least in Holland; the g.p. sees his patients less often than in small ones. We have no data available to explain this relationship; from morbidity studies in the United Kingdom, however, we learn that smaller practices are characterized by a relatively

higher number of follow-up visits, and not by a higher number of first contacts. It is likely that this holds for the Dutch situation, too. Anyhow, the relationship is always ascertained. That being so, it is clear that, even if we hypothesize a positive effect of list size on the number of referrals per 1000 contacts, the effect on the number of referrals per 1000 patients becomes nil or close to it, depending on the relative magnitude of the forementioned two effects. This example of the complex way in which a variable can influence the total number of referrals per 1000 patients could be followed by many others without problems. Time does not permit me to do so; besides, the purpose of this first part of my lecture was only to show two things: first that it pays for any researcher who is interested in explaining differences in referral levels to do a thorough conceptual analysis before he starts his actual data-collection, and second that, due to the heterogeneous character of the measure we commonly use for the referral-level (being the number of referral-cards per 1000 patients) we cannot hope for very high amounts of explained variance. Only a type of research in which we have data available that link the different types of referrals to the right denominator could explain more variance. Since this type of research is extremely costly, we have to manage with what we can easily get, which is in the Dutch situation the number of referral-cards per 1000 sick fund patients per year, for a number of different specialties. The following empirical results are based on this measure for the referral rate.

3. Some empirical results

The research of which I want to show some results is an investigation into the main determinants of the referral rates of solo general practitioners. Since we wanted to find out if differences in referral rates could partly be explained by differences in personal characteristics of general practitioners, only g.p.'s practising in solo-practice could be considered: as I said before, figures for associations, group practices and health centres are computed as an average for all doctors in the group.

Furthermore, we wanted practices that would be more or less comparable with respect to morbidity, so we selected only doctors practising in urbanized rural areas and dormitory towns. The data presented are based on a represen-

tative sample of 350 general practitioners all over the Netherlands. The dependent variables we used were sick-fund referral rates for internal medicine, general surgery, ophthalmology and all specialties. In this lecture I will show only results for internal medicine and ophthalmology. As explaining variables we used a set of structural variables and a set of others; the structural variables we used were:

Slide 3

- is there a hospital in the town where the g.p. practices;
- minutes to nearest hospital (by car, doctors estimate);
- list size (for sick-fund patients: exact figures; for private patients: doctor's estimate);
- number of contacts per patient (computed from doctor's estimate of the number of patients he sees on a normal, resp. busy day);
- beds per 1000 inhabitants;
- percentage sick-fund-patients over 65;
- region where surgery is located.

Besides these structural variables we used a few variables to measure the doctor's opinion about his profession and the kind of diseases and complaints he feels able to deal with, compared to what he thinks fit for the specialist to diagnose and treat. As one of these variables we used a list of 25 diseases and asked the general practitioners to rank these diseases on a four-point scale running from 'this diagnosis is typically a job for the specialist' to 'this diagnosis is typically a job for the g.p.', with two intermediate positions. By summing all scores we created a new variable called 'diagnostic claims': the higher the value on this variable, the more diagnoses the doctor feels he can deal with and the less diagnoses he thinks the specialist should deal with.

Furthermore, we formulated fourteen statements about the relation between general practitioner and specialist. The g.p. was asked if he agreed or disagreed with these statements; to give an idea of the nature of the statements I will show two of them, with answers in percentages.

Slide 4

	strongly agree	agree	disagree	strongly disagree	undecided
If general practitioner and specialist disagree whether a patient should be admitted to hospital, the specialist's opinion should turn the scale.	9	27	35	15	14
In treating hospital patients, the share of the g.p. should be as big as the share of the specialist.	6	23	48	15	8

Factor analysis revealed that 8 of these items formed a scale. General practitioners scoring high on this scale have what we might call a 'fighting spirit' when it comes to the question whether the g.p.'s or the specialist's word should be final. We might also say that doctors with a high scale-score are 'primary care minded' as we shall call this variable. The last variable we used is very simple: we asked all g.p.'s to mark on a list of 12 therapeutic and diagnostic techniques those techniques they employ themselves. Examples are incision of a panaritium, incision of an abscess of the tonsils, the removal of an atheromcyste, etc. A variable 'number of techniques' was created by adding all employed techniques.

Background variables such as age and years of experience of the g.p. and membership of NHG (Dutch College of General Practitioners) had no significant relation with any referral rate and will not be discussed further.

To determine the amount of variance that could be explained and the relative contribution to it of each variable we used the statistical technique of regression analysis. The results of this technique are not very suitable to present in their ordinary, numerical way during a lecture like this, so I have tried to visualise them (....)

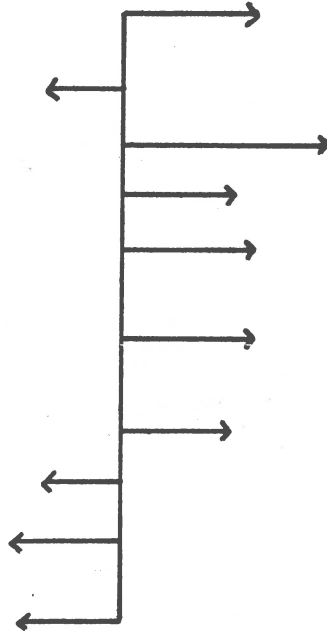
At the bottom of each column, the percentage of variance explained is written. As I said before, only results for internal medicine and ophthalmology will be presented. Variables that have no significant effect on either of these referral rates were left out of the final table.

Slide 5

1. Hospital in town
2. Distance to hospital
3. Southern region
4. Beds per 1000
5. Percentage over 65
6. Percentage in sick-fund
7. Contacts per patient
8. Diagnostic claims
9. Primary care minded
10. Number of techniques

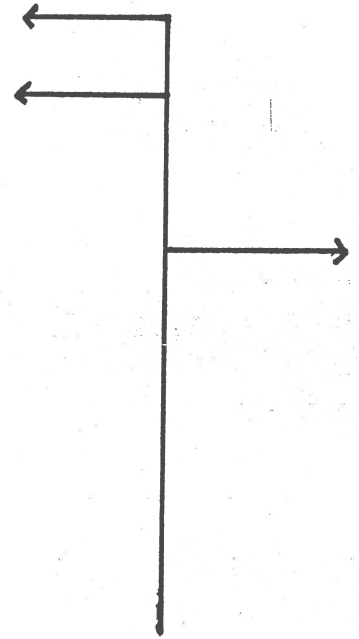
Referral rate for internal medicine

- +



Referral rate for ophthalmology

- +



Explained variance

35%

11%

If we look at the results for internal medicine first, we see that a rather satisfactory 35 % of the total variance is explained. The strongest effect comes from a regional variable: doctors in the south of Holland have significantly higher referral rates than their colleagues in other parts. More detailed analysis reveals no differences between the southern g.p.'s and their colleagues, so it is supposed that this difference should be ascribed to a worse health status of the inhabitants of the southern provinces, a fact that has been ascertained in many investigations.

The variables 'hospital in town' and 'distance to hospital' both have a significant effect in the expected direction. In every investigation on this topic, doctors in Holland in towns where a general hospital is located and doctors who practise close to a hospital have higher referral rates. In Holland this relation between distance and referral rate is more or less an 'iron law', but is not found everywhere.

Re-analysis of data of the Second National Morbidity Survey in England by Van der Zee, for instance, showed no effect of distance to hospital on referral rate. An explanation for this difference between Holland and England on this point may be found in the much stricter way hospital facilities are planned in the United Kingdom. For a costly and cost-producing good like specialist care, that should only be used if it is really necessary, a distance effect points to a less efficient allocation of resources: that means that the number of specialists per 1000 inhabitants in the Netherlands could probably be lowered without harmful effects on the health status of the population, provided of course that it will not become so low that patients get devoid of necessary care. In our data we found a weak relationship between the distance to the nearest hospital and the diagnostic claims the g.p. makes, his 'primary care mindedness', and the number of techniques he employs. But, as is shown from the data presented here, the distance variable has an effect on the referral rate which is independent of other variables. To explain this everpresent relation between distance and referral rate, two lines of reasoning can be followed. First we might reason that general practitioners in deciding to refer the patient or not, take account of the trouble a referral may give the patient in terms of a long and inconvenient journey to a hospital, long waiting periods, how to take care of small children during hospital visit, etc. This might explain why doctors far from hospitals are less inclined to refer a patient. Second we might

suppose that the difference in referral rates is primarily due to a difference in the number of referrals on patients request, for the same reasons as mentioned above. The present data give no information at all on these topics, but research is being undertaken in which we hope to shed some more light on this matter. In Holland a new town is being built on new land gained from the sea. For fifteen years this town was about 20 miles from the nearest hospital, but in september 1982 a new hospital was built. By carefully following referral patterns and doctors' and patients' opinions on referrals, we hope to get an idea of the way the distance factor influences referral rates.

Going back to our regression-results, we see that the number of beds per 1000 inhabitants, which is a crude measure for the size of available specialist health care, has a positive effect on the referral rate. This is an other example of the adagium 'supply generates demand in health care'. The positive effect of the variable 'percentage over 65' is not surprising: older people objectively need more specialist care. The positive effect of 'percentage in Sick-Fund' is found in some other investigations too. It means that a doctor refers more sick-fund-patients per 1000 when he has relatively less private patients. An explanation might be that in the Dutch system, with a capitation-system for sick-fund-patients and a fee-for-service-system for private patients, devoting one's time to private patients, after 'making' that time by referring sick-fund patients, is economically advantageous for the g.p. Since we know nothing of referrals and care of private patients, this relationship should be treated with care.

The positive impact of the number of contacts per patient indicates that in 'busier' practices referral rates are higher. 'Busier' does not mean 'larger', on the contrary. In our material too, the relation between list size and number of contacts per patient is moderately strong negative.

The last three variables have moderate intercorrelations, but all have an independent negative effect on the referral rate. Doctors who have a sort of 'fighting spirit' when it comes to letting the specialist decide or decide themselves, who are inclined to solve diagnostic problems themselves, have significantly lower referral rates.

This is an important result.

It means that lower referral rates can not only be achieved by manipulating structural variables like the number of specialists and the location of hospitals, but also by education and postgraduate training. Every general practitioner knows that part of the referrals he makes are not really necessary, and that part of the actions of the specialist are unnecessary too. To know this is one thing, to cope with it is another.

Our data indicate that teaching general practitioners or g.p.'s-to-be a form of basic security can be very fruitful - both when it comes to feeling secure when practising the difficult art of diagnosing, as when the relation with the specialist is concerned. A general practitioner who has learned to be 'polite but firm' towards the specialist, if the expression is permitted, can make a significant contribution to a primary health care that solves the majority of problems itself, and refers patients only for specialist care if that is really necessary. In health centres in the Netherlands, where doctors can find this basic security and what I have called 'fighting spirit' towards the specialist by mutual consultations and discussing diagnostic problems, the referral rate for internal medicine is some 18% lower than in solopractices. This is in concurrence with the data and the interpretation I have given for solo-practitioners.

When it comes to sizeable effects of variables like these on the total referral rate, however, we should realize that internal medicine is a specialty that has relatively vague boundaries with general practice, so that referral rates can be influenced at all by opinions of general practitioners about the division of labour between them and the specialist. For ophtalmology, where many referrals are administrative in nature, influence of doctor's opinion is nil as we see; for general surgery there is some influence, but less than in the case of internal medicine. Another striking difference between internal medicine and ophtalmology is the negative effect of the variable 'hospital in town', while the distance to the hospital has a negative effect, just like for internal medicine. The correlation between these two variables is strong (-.52), but statistically permits this strange result. The only explanation I can think of is the following: it often takes weeks or months before people can make an appointment with an ophtalmologist, and long waiting-periods are common. Given the fact that in Holland opticians are allowed to prescribe spectacles, people living in a bigger place, where

both a hospital and an optician are at arm's length, will prefer to pay some money themselves to the optician instead of waiting a long period in the hospital. When people live far away from both hospital and optician they have to make a journey for their spectacles anyway, and additional waiting time is less problematic. With this reasoning we can explain both the negative effect of the variable 'hospital in town' and the negative effect of 'distance to hospital'.

Coming back to where I started, it is obvious that more detailed and sophisticated data-collection would probably show not only that the influence of the doctor's opinion about his work is larger for some specialties than for others, but also that the influence is larger for some of the types of referrals I have distinguished than for others.

The Practice Activity Analysis described by Fleming and Maes, in which all what I have called 'administrative' referrals are left aside, gives rise to the hypothesis that the doctor's attitude towards his work has influence on a number of output-criteria indeed. Costly as research like that may be, especially if it is undertaken on a large scale and sufficiently long to give stable differences between doctors, our results (and those of a number of other investigations at the Netherlands Institute of General Practitioners) indicate that more detailed analysis is definitely worth the trouble.

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